

# Lecture #05

Date: Sept 1<sup>st</sup>, 2025

Day: Monday

## How to develop a class diagram?

- 1) Noun → Class
- 2) Verb b/w Nouns - Association
- 3) Types, kinds, categories  
→ Inheritance / Generalization
- 4) Characteristics / Attributes  
→ Data Members
- 5) Tasks, operation, actions  
→ Member functions

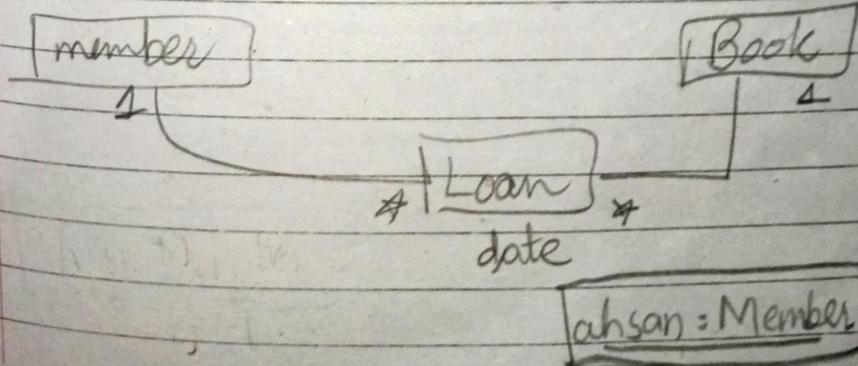
### Library Management System:

→ System Description:

- Types of users:  
Desk Clerks, Librarian, Member

→ Library has books and DVDs.

→ Members borrow books.



# Lecture # 06

Date: Sept 3, 2025

Day: Wednesday

Class Diagram:

Another Example

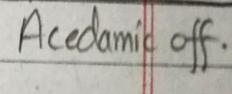
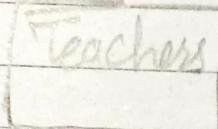
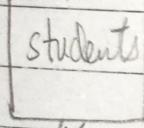
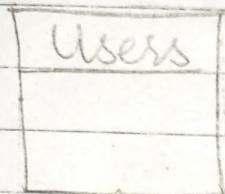
→ Course Registration System:

Entities:

- Students
- Courses

Users:

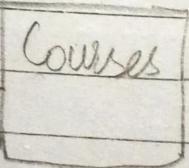
- Students add, drop, ...
- Teacher Attendance, marks
- Academic officers Open Reg...  
Closed change.



Register / add / drop

edit / del

open / close



Teacher

teach

Section

Registration

\*

OS-a

OS: course

OS-b

sda-a

sda: course

sda-b

81  
A

82

C

Naeem

83  
C

Date: Sept 8, 2025

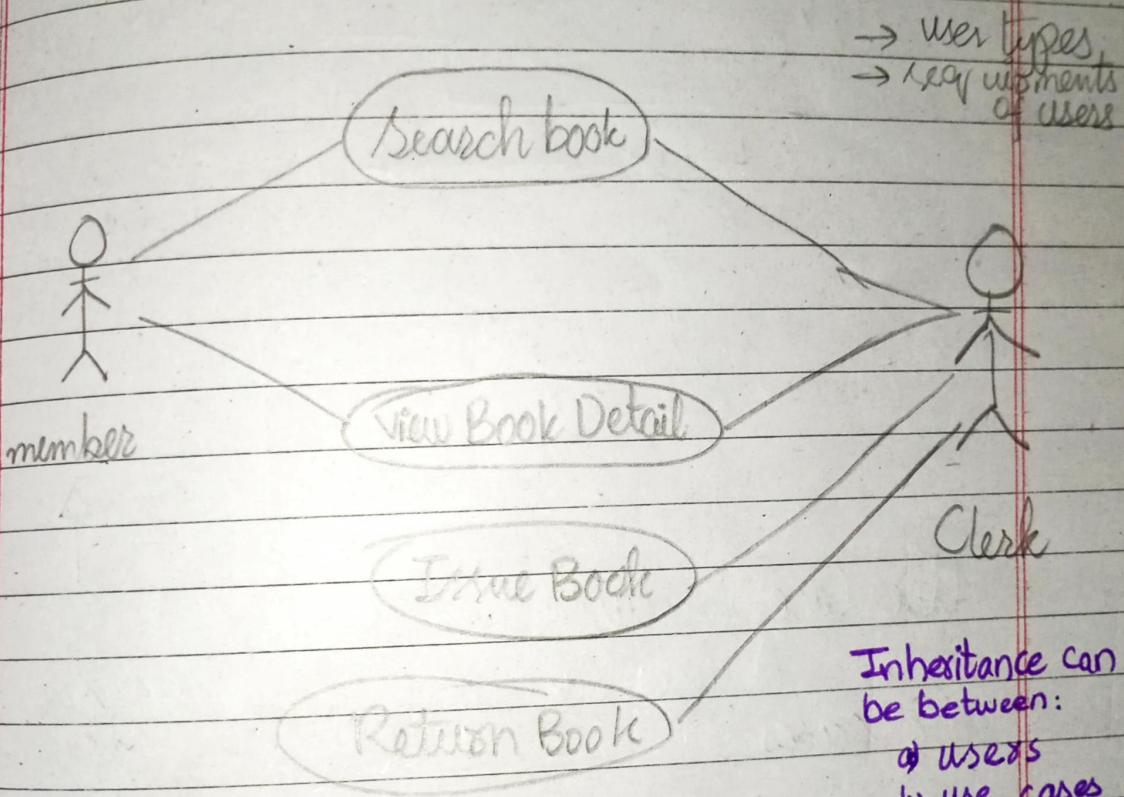
Day: Monday

## Use case Diagram

→ A use case diagram documents requirements:

Elements:

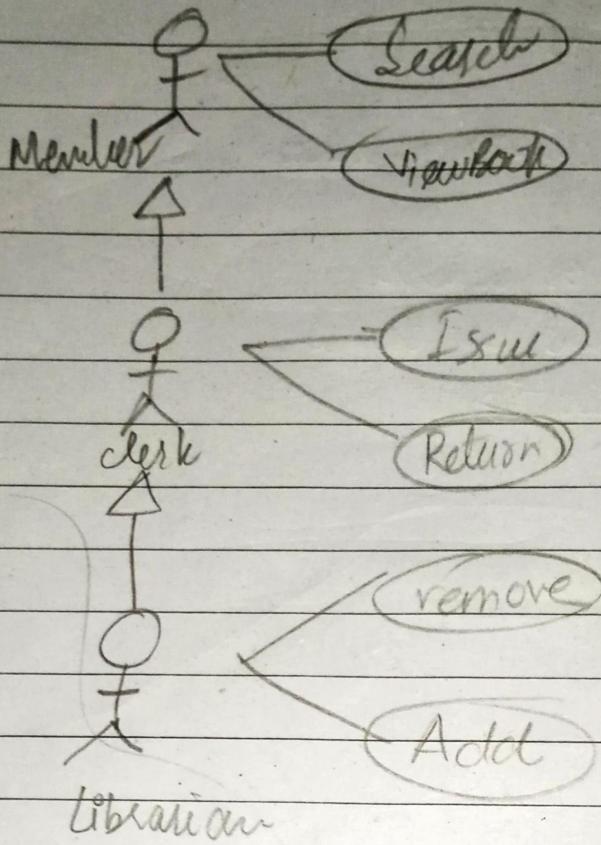
- a) Users or actors
- b) Use case or tasks
- c) Associations



- Inheritance / Generalization
- Use case Inclusions
- " " Extentions
- Non-human actors

Date: \_\_\_\_\_

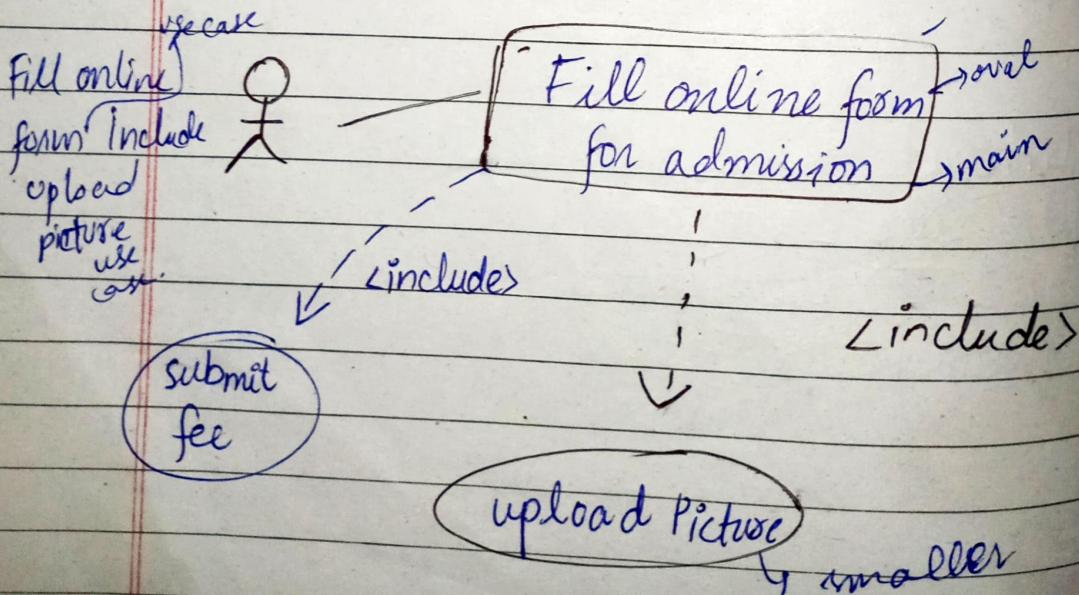
Day: \_\_\_\_\_



## Use Case Inclusion:

A use case may include other use cases.

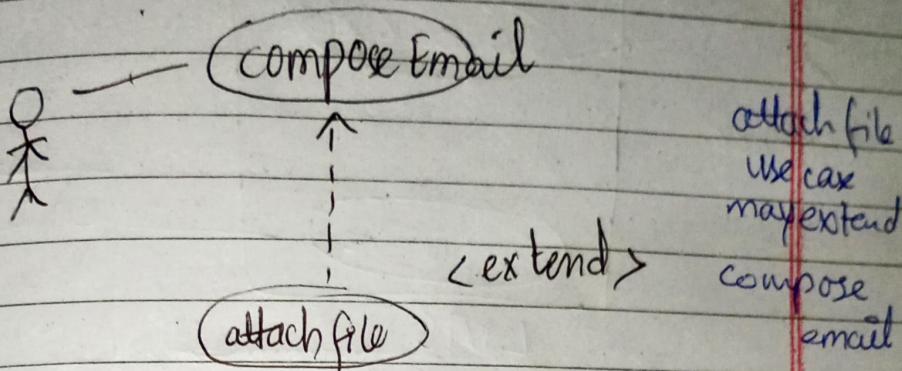
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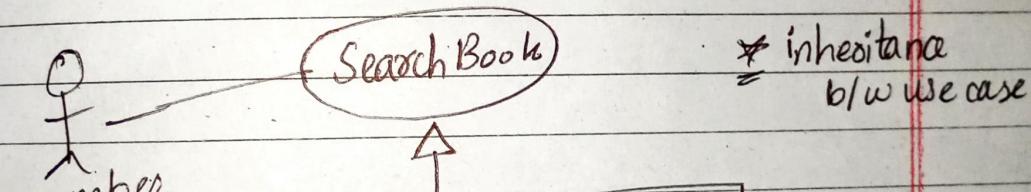
Date:

Day:

# Use Case Extensions

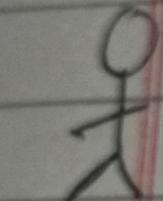


=> Inheritance b/w use cases :

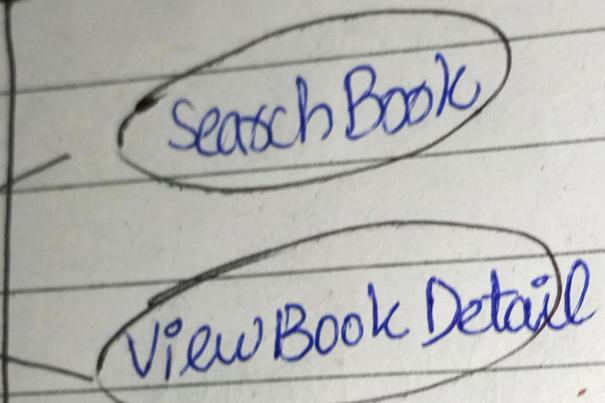


Day:

Date:



Member



LMS

Lactor>  
Accounting  
System

external

Date: 10 Sep 2025

Day: Wednesday

## Topic: Use Case Description

A USD describes the interaction b/w a user and a system to accomplish the task.

Use Case: Issue Book (Add Loan)

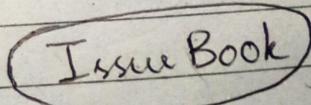
System: Library Management System

User: Desk Clerk

Pre-Condition: User has "Logged In"

Steps:

1. User Selects "Issue Book" option.
2. System prompts for the book id
3. User enters the book id.
4. System displays the Book's info and asks for the member id.
5. User enters the member id
6. System shows member's details
7. User selects the "Save Loan" option.
8. System stores the record, and displays a due date.
9. User stamps the due date onto the Book.



for every use case, use case description can be written.

## Alternate Paths:

(6B) if the membership has expired, show appropriate error message.

(4B) : if the book belongs to reference section then the system shall halt the transaction.

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Use case: Register courses

System : Flex

User : Student id

Pre-condition: User has got admission in uni.

### Steps:

1. Student selects "Register courses" option.
2. System displays the available courses
3. User selects the required courses
4. User selects the confirmation message.
5. System loads
6. User can see registered courses on transcript page.